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ABSTRACT

To understand what kinds of mental processing take place during reading and how the child encodes information that is presented, a study investigated the comprehension of a story by asking the reader to take part actively in the decision-making of the protagonist. Subjects, 56 children from a fourth- and sixth-grade class at an elementary school in Dayton (Ohio), were given true-false comprehension and multiple choice recognition tests after viewing a story on a computer screen. Half of the children were in a "choices" group and told that during certain parts of the story, they would be asked by the computer to help the main character by making a selection from alternatives A or B for the particular dilemma. Results indicated that the opportunity to make choices for the protagonist facilitated the comprehension and recognition scores of the children who were given that chance. (Two figures are included.) (MS)

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Active Participation in the Reading of Fourth and Sixth Grade Children

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Introduction

It has been established that a schema is important for the recall of things, objects, and facts (e.g., Anderson, 1978 and Buss, Yussen, Mathews, Miller, & Rembold, 1983). The use of a schema also plays a very important role in the comprehension of text and stories. People use the story structure to guide their recall and comprehension (Kintsch & van Dijk, 1978, and Mandler, 1978). Furthermore, Cirilo and Foss (1980) have suggested that the processing of text is guided by the framework of the story and that these frameworks should allow readers to distinguish major from minor events.

A type of schema that has been cited in the text comprehension literature is the notion of "story grammar". Cirilo and Foss (1980) view story grammar as "organized bodies of rules that represent the multidimensional structure of a story; it shows the relationship among the sentences that compose it" (p. 96). In addition, a story grammar is a formal rule system that is used to describe regularities in story structure and the forms they take (Mandler & Goodman, 1982). A story grammar specifies these forms so that a story can be parsed into a set of constituent parts and uncovers the recurring forms in the text. Thus, a story grammar can be used to probe a story schema, and the distinction between a story grammar and story schema is more clearly focused: a story grammar is a formal rule system used to describe regularities in story

structure and a story schema is a mental structure that reflects those regularities (Mandler & Goodman, 1982).

A central issue in understanding reading problems is precisely what kinds of processing take place during reading and how the child encodes information that is presented. The present study investigated the comprehension of a story by asking the reader to actively take part in the decision making of the protagonist.

Rationale and Nature of the Present Study

According to Mandler and Johnson (1977) at the point where some psychological reaction to a situation in the development of an episode was encountered by the protagonist, the child was asked to make a decision for the protagonist. Children were asked to state a goal and to give justification based upon simple reactions which were not explicitly given in the story prior to the choice point. It was predicted that by creatively using a well-structured and organized story schema, younger and/or less skilled readers' comprehension and recall of details in a story should be better than the comprehension and recall of readers who do not have the opportunity to create the story schema.

Method

Subjects

Fifty-six children from a fourth- and sixth-grade class at an elementary school in Dayton, Ohio participated in the study. The children in each grade were yoked with a child

of similar ability to create 28 matched pair dyads. One child in each pair was randomly assigned to the "choices" condition, while the other child was in the "no choices" condition. A median split procedure by teacher ratings and CAT scores was performed dividing the children into "high ability" and "low ability" groups. Children were randomly assigned to reading condition. Gender was counterbalanced with grade and choice condition.

Design

The design was a 2 (Grade) x 2 (Ability) x 2 (Reading Condition) x 2 (Test - comprehension & detail) x 2 (Session) mixed fatorial design. Grade and Ability were the between subjects factors, while Reading Condition, Test, and Session were within subjects factors. The dependent variables were scores on the comprehension and recognition tests.

Procedure

Each child was individually tested in a room provided by the school. The children were told that they were going to read a short story on a computer screen and asked some questions about the story after it. A marked computer key was used to advance to the next sentence of the story and there was no time limit for story completion.

The choices group was further told that during certain parts of the story, they would be asked by the computer to help the main character by making a selection from alternatives A or B for the particular dilemma. At this time, the children were also asked to justifiy their

selections by providing rationale. It was felt that rationale for choices would cause subjects to integrate material previously read into their decisions of alternatives.

"True-false" comprehension and multiple choice recognition tests were given immediately after the story. The true-false questions were designed to test comprehension of story ideas, while the multiple choice test was to test story details. One week later, the same tests with different question ordering were again administered.

Materials

Two story classics were modified for use in the study: Jules Vernes's 20,000 Leagues Under the Sea and Daniel Defoe's The Adventures of Robinson Crusoe. The stories were somewhat changed and condensed from their original forms, resulting in short stories containing some basic elements of the original novels in four episodes. At the center of each episode was a choice point where a dilemmma for the main character was encountered. This is the point where the choices group was questioned and provided rationale for alternative selections.

Testing Materials

Comprehenison test. "True or false" questions were created to test the comprehension of various parts of each story. The questions were designed so that logical inferences had to be drawn based on information presented, but not explicitly given.

Recognition test. Multiple choice items were developed to probe for details from the stories. The questions tested recall of relatively trival details throughout the story. Answers were to be based on what was actually read.

Results & Discussion

Separate analyses of variance (ANOVA) were used to analyze the correct responses on each type of test (comprehension and detail). Initial analysis indicated no differences between the stories and no effect of session for the comprehension test, so the data was collapsed across these variables.

Comprehension Test Scores

High ability subjects performed better ($\bar{X}$=19.07) on the comprehension tests than did low ability subjects ($\bar{X}$=15.57), $F(1,24)=17.46$, $p<.001$. As expected, sixth graders gave more correct respones ($\bar{X}$=18.34) than did fourth graders ($\bar{X}$=16.30), $F(1,24)=5.91$, $p<.05$. More importantly, subjects in the choices condition performed better than did subjects in the no choices condition ($\bar{X}$=18.41 & 16.23, respectively), $F(1,24)=16.52$, $p<.001$.

However, interpretation of the main effects of Grade and Reading Condition must be viewed in light of the significant Grade x Reading Condition interaction. The Grade x Reading Condition interaction was highly significant, $F(1,24)=7.83$, $p<.01$. Calculation of simple effects indicated that the opportunity to make choices was more beneficial for the fourth graders (18.14 vs 14.46),

$F(1,24)=11.77$, $p<.01$, than for sixth graders (18.86 vs 18.00), $F<1$.

Recognition Test Scores

As expected, sixth graders performed better on the recognition items ($\bar{X}=10.98$) than did fourth graders ($\bar{X}=9.00$), $F(1,24)=5.05$, $p<.05$. As predicted, those in the choices condition performed better than those in the no choices condition ($\bar{X}=10.70$ & 9.29, respectively), $F(1,24)=6.06$, $p<.05$.

Again, however, these main effects are clouded by two interactions. The Ability x Reading Condition interaction was significant, $F(1,24)=6.06$, $p<.05$. Simple effects analysis indicated superior performance by the high ability subjects in the choices condition, $F(1,24)=6.06$, $p<.05$.

Finally, there was a significant Grade x Ability x Session interaction, $F(1,24)=5.48$, $p<.05$. All groups showed a decline in test scores from session one to session two. Both high ability fourth and sixth graders showed similar declines from session one ($\bar{X}=11.14$ & 11.79, respectively) to session two ($\bar{X}=9.36$ & 10.36). However, the low ability fourth graders showed only a slight decline ($\bar{X}=8.07$ & 7.43) which could be the result of a floor effect. The largest decrease was seen in the low ability sixth grade group ($\bar{X}=12.09$ & 9.71). This decline is larger, proportionally, than the decline of the other groups.

The present findings indicate that providing the opportunity to make choices for the protagonist facilitated

the comprehension and recognition scores of children versus those not given the chance to make choices. The effect of reading condition upon comprehension was greatest among low ability fourth graders. Less skilled readers, who are beginning to develop their reading comprehension skills and are uncertain about which parts of stories should be the focus of their attention may, generally, be more influenced by such changes in story presentation. According to theories of story grammar (e.g., Mandler, 1978), the comprehension of stories requires that certain story actions be understood as components of an episode. Understanding an episode itself, requires identification of a complication, a psychological reaction, and plans for its resolution. Beginning and poor readers may not perform well on tests of comprehension due to their failure to identify, construct or use a story grammar. Perhaps the less skilled readers direct a greater proportion of their cognitive capacity to the processing of minor story details and, therefore, are less likely to correctly identify and utilize the appropriate story grammar to guide comprehension.

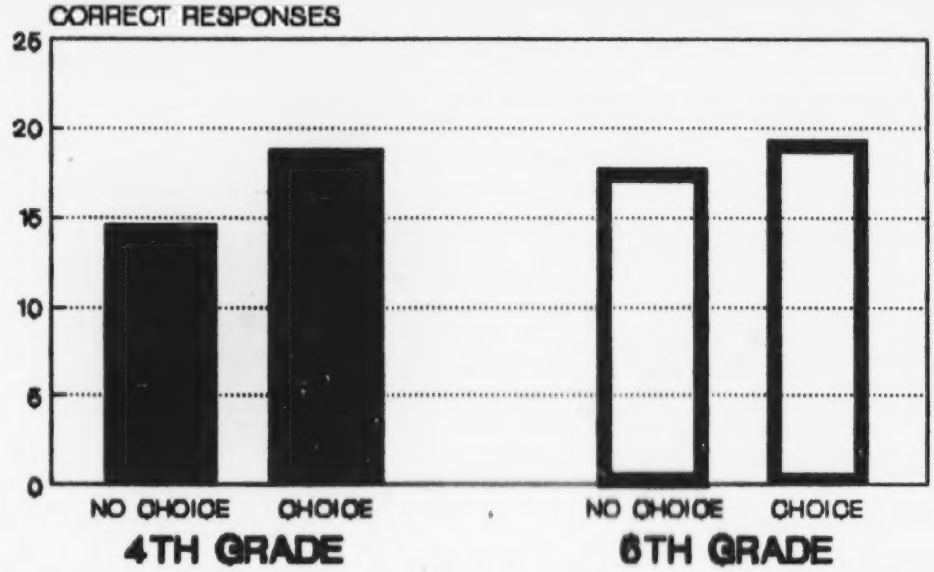
While making choices had a facilitative effect on the comprehension scores of fourth grade subjects (especially among low ability fourth graders), it was more beneficial to high ability subjects' recognition of details from the story. High ability children are already effective comprehenders of the ideas of stories and making choices facilitated their addition of details to the story grammar

they had developed about the story. Since high ability children are effective comprehenders, making choices might have helped to consolidate such general concepts and enabled them to look for more details to add to what they already knew about the story. The result is a more complete understanding of the story.

This study has several implications for classroom teaching. Reading programs can be developed which enable students to become more active in their reading. Perhaps less skilled readers could be encouraged to adapt a strategy wherein they spontaneously anticipate the main character's decisions and become more sensitive to the psychological reactions, goal paths, activities, etc. much as the "choices" subjects in the current study.

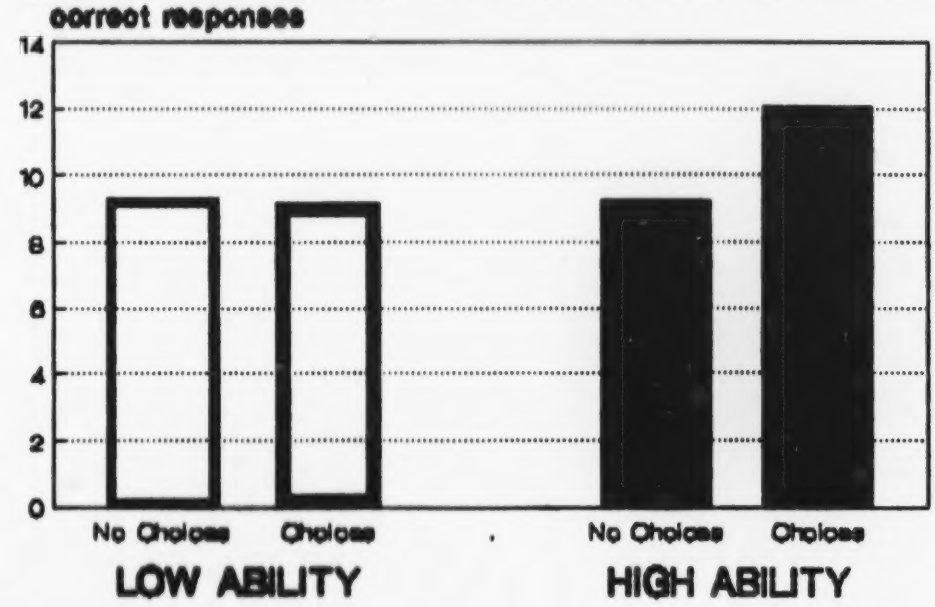
Teachers can also help the children by prompting the identification of a story grammar by asking timely questions. As the present research demonstrates, this helps the readers to integrate the information in the text and to activate a relevant knowledge schema. The activation of this schema enables the readers to more completely comprehend the story by inferring actions that are not explicitly given. All stories have an underlying structure and helping to identify the structure by the present procedure would appear quite easily applied in the classroom.

FIGURE 1
MEAN COMPREHENSION RESPONSES a



a 12.0 indicates chance performance

FIGURE 2
MEAN CORRECT DETAIL RESPONSES b



b 4.6 Indicates Chance Performance